模拟汽车器件指南





放大器
音频
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接口
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2008

目录

德州仪器对汽车市场的承诺

德州仪器(TI)一直致力于为汽车市场提供出众的、且经济高效的解决方案，并以其卓越的产品资料(product documentation)、准时的产品交付以及相一致的规范的服务形式为市场提供评判标准(benchmark)。

产品有效性/承诺

TI可支持汽车工业领域所定义的需求，并持续不断的扩展汽车器件产品的组合。TI具有超过30年的客户服务经验，可满足客户严格的要求，使客户的产品在质量、可靠性及成本方面均达到目标需求，成功的立足于当今市场。

TI的汽车器件产品性能

- TS16949认证
- 汽车温度范围
- 汽车器件产品品质认证
- 6个月的产品变更通知



双级、电压输出电流并联监视器
INA270、INA271

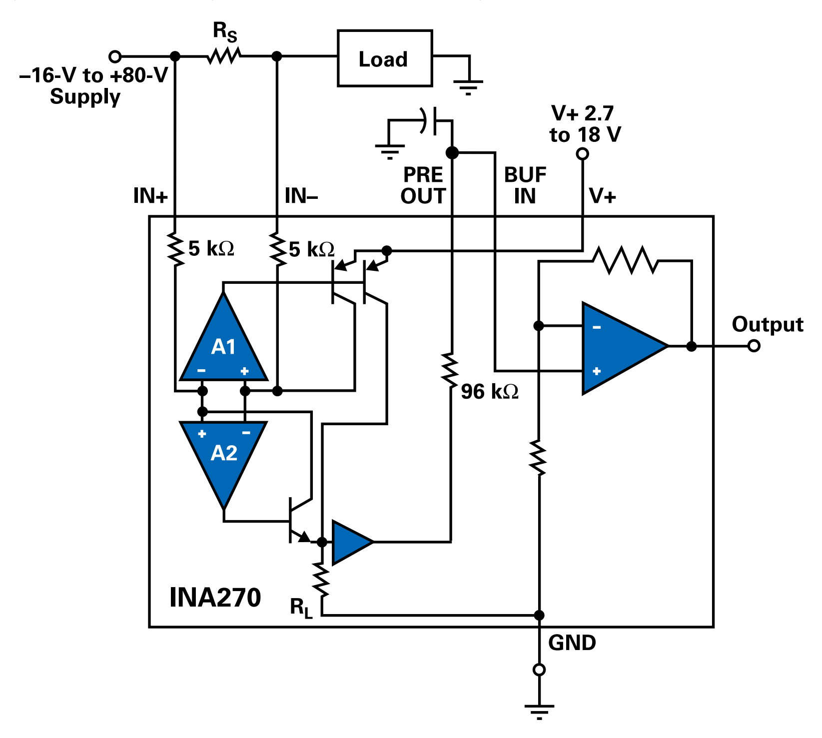
敬请访问**www.ti.com/sc/device/INA270A-Q1或www.ti.com/sc/device/INA271A-Q1**，以获取样片及数据表。

主要特点
- 宽共模电压范围(–16V至+80V)
- 电源电压：2.7V至18V
- 共模态抑制比(CMRR)：120dB
- 偏置电压：0.5 mV
- 总体输出误差：±3%（最大值）
- 双级拓扑结构，可支持带滤波的缓冲输出

受益
- 可支持带滤波的缓冲输出
- 免除了额外的运算放大器
- 采用单个电容即可完成滤波

TI的INA270（增益G = 14 V/V）以及INA271（增益G = 20 V/V）为双级、高侧电流并联监视器，具有宽共模电压范围(–16V至+80V)，从而使其极为适用于汽车应用——需要针对大电压瞬变及电池电位反向进行保护。该器件的电源电压范围为2.7V至18V，在整个扩展温度范围（–40˚ C至+125˚ C）内的最大输出误差不超过±3%。

由于其共模态抑制比(CMRR)达到了120dB，使得共模电压在动态范围上的问题不复存在。INA270/1的双级拓扑结构轻松的实现了滤波并保护了缓冲电压输出，免除了对额外运算放大器的需求。典型的应用包括了控制无刷直流电机([BL]DC-motor)及可变力螺线管(variable-force solenoid)。



电流并联监视器选择指南

Device	Description	Gain (V/V)	Common Mode Input Range (min) (V)	Input Offset (±) (max) (mV)	Input Offset Drift (±) (typ) (μV/°C)	CMRR (min) (dB)	Small Signal Bandwidth (typ) (MHz)	Quiescent Current (±) (typ) (mA)	V_S (min) (V)	V_S (max) (V)	Auto Qual (Q1)
INA193A/4A/5A	Wide common mode	20, 50, 100	–16 to 80	2	2.5	100	0.5, 0.3, 0.2	0.37	2.7	18	Y
INA196A/7A/8A	Wide common mode	20, 50, 100	–16 to 80	2	2.5	100	0.5, 0.3, 0.2	0.37	2.7	18	Y
INA200/1/2	Integrated comparator and reference	20, 50, 100	–16 to 80	2.5	5	100	0.5, 0.3, 0.2	1.35	2.7	18	Preview
INA203/4/5	Dual integrated comparators and ref	20, 50, 100	–16 to 80	2.5	5	100	0.5, 0.3, 0.2	1.35	2.7	18	Preview
INA206/7/8	Dual integrated comparators and ref	20, 50, 100	–16 to 80	2.5	5	100	0.5, 0.3, 0.2	1.8	2.7	18	Preview
INA209	Bi-directional, current/power with I^2C interface	Programmable	0 to 26	0.1	0.1	100	—	1	3.0	5.5	Preview
INA270/1	Wide common mode, filter option	14, 20	–16 to 80	2.5	2.5	100	0.13	0.7	2.7	18	Y
INA138	Current output	1 to 100	2.7 to 36	2	1	100	0.8	0.025	2.7	36	Y
INA139	Current output	1 to 100	2.7 to 36	2	1	100	0.44	0.06	2.7	40	Y
INA168	Current output, wide supply range	1 to 100	2.7 to 60	2	1	100	0.8	0.025	2.7	60	Y
INA169	Current output, wide supply range	1 to 100	2.7 to 60	2	1	100	0.44	0.06	2.7	60	Y



精密/低电压运算放大器

精密运算放大器选择指南 ($V_{IO} \leq 1mV$)

Device[1]	Description	Ch.	V_S (min) (V)	V_S (max) (V)	Iq per Ch. (max) (mA)	GBW (typ) (MHz)	Slew Rate (typ) (V/µs)	V_{IO} (25°C) (max) (mV)	Offset Drift (typ) (µV/°C)	I_B (25°) (max) (pA)	CMRR (min) (dB)	V_N at 1 kHz (typ) (nV/√Hz)	Single Supply	Rail-to-Rail	Auto Qual (Q1)
OPAy333	Zero drift	1, 2	1.8	5.5	0.017	0.35	0.16	0.01	0.02	200	106	1.1	Y	I/O	Preview
TLE2037A	High speed, reduced V_{IO}	1	8.0	38	5.3	50	7.5	0.025	0.2	90000	117	2.5	N	N	Y
TLE2037	High speed	1	8.0	38	5.3	50	7.5	0.1	0.4	90000	100	2.5	N	N	Y
OPAy365	Zero-crossover, RRIO	1, 2	2.2	5.5	5	50	25	0.2	1	10	100	5	Y	I/O	Preview
TLE202xA	Wide voltage range, reduced V_{IO}	1, 2, 4	4.0	40	0.3	1.2	0.5	0.4	2	70000	82, 85, 87	17	Y	—	Y
TLE202x	Wide voltage range	1, 2, 4	4.0	40	0.3	1.2	0.5	0.6	2	70000	85, 80	17	Y	—	Y
TLC225xA	µPower, rail-rail out, reduced V_{IO}	2, 4	4.4	16	0.0625	0.2	0.12	0.85	0.5	60	70	19	Y	Out	Y
TLV225xA	Low voltage, rail-rail out, reduced V_{IO}	2, 4	2.7	16	0.0625	0.2	0.1	0.85	0.5	60	65	19	Y	Out	Y
TLC226xA	Rail-rail out, reduced V_{IO}	2, 4	4.4	16	0.25	0.71	0.55	0.95	2	800	70	12	Y	Out	Y
TLC227xA	Low noise, reduced V_{IO}	2, 4	4.4	16	1.5	2.2	3.6	0.95	2	60	70	9	Y	Out	Y
TLV2422A	Low voltage, reduced V_{IO}	2	2.7	10	0.075	0.052	0.02	0.95	2	60	70	23	Y	Out	Y
TLV243xA	RRIO, reduced V_{IO}	2, 4	2.7	10	0.125	0.5	0.25	0.95	2	60	70	18	Y	I/O	Y
TLV244xA	Reduced V_{IO}	2, 4	2.7	10	1.1	1.75	1.3	0.95	2	260	65	18	Y	Out	Y

[1]*x indicates: 0 = single with shutdown, 1 = single, 2 = dual, 3 = dual with shutdown, 4 = quad, 5 = quad with shutdown. y indicates: no character = single, 2 = dual, 3 = triple, 4 = quad.*

低电压运算放大器选择指南 ($V_S \leq 2.7\,V$)

Device[1]	Description	Ch.	SHDN	V_S (min) (V)	V_S (max) (V)	Iq per Ch. (max) (mA)	GBW (typ) (MHz)	Slew Rate (typ) (V/µs)	V_{IO} (25°C) (max) (mV)	Offset Drift (typ) (µV/°C)	I_B (max) (pA)	V_N at 1 kHz (typ) (nV/√Hz)	Rail-to-Rail	Auto Qual (Q1)
OPAy333	Zero drift	1, 2	N	1.8	5.5	0.017	0.35	0.16	0.01	0.02	200	1.1	I/O	Preview
LMV93x	1.8V with RRIO	1, 2, 4	N	1.8	5.5	0.185	1.4	0.35	4	5.5	65000	60	I/O	Y
OPAy348	1MHz, 45µA, RRIO	1, 2, 4	N	2.1	5.5	0.065	1	0.5	5	2	10	35	I/O	Preview
TLV277x	High slew rate	1, 2, 4	Y	2.5	6.0	2	5.1	2.7	2.5	2	60	21	Out	Y
TLV240x	Wide voltage range, sub-µPower, RRIO	1, 2, 4	N	2.5	16	0.00095	0.0055	0.0025	1.2	3	300	—	I/O	Y
LMV34x	Rail-to-rail output	1, 2, 4	Y	2.5	5.5	0.17	1	1	4	1.7	120	40	Out	Y
LMV82x	Wide bandwidth	1, 2, 4	N	2.5	5.5	0.3	5	2.5	6	1	90000	45	Out	Y
TLV2422	Low power, rail-rail output	2	N	2.7	10	0.075	0.052	0.02	2	2	60	23	Out	Y
TLV237x	Wide voltage range, 3MHz	1, 2, 4	Y	2.7	16	0.66	3	2.4	4.5	2	60	39	I/O	Y
TLV244x	Rail-to-rail output	2, 4	N	2.7	10	1.1	1.75	1.3	2	2	260	18	Out	Y
TLV246x	Low noise, wide bandwidth, 25mA drive	1, 2, 4	Y	2.7	6.0	0.575	6.4	1.6	2	2	14000	11	I/O	Y
TLV246xA	Low noise, wide bandwidth, 25mA drive	1, 2, 4	Y	2.7	6.0	0.575	6.4	1.6	1.5	2	14000	11	I/O	Y
TLV247x	Low bias current, 35mA drive	1, 2, 4	Y	2.7	6.0	0.75	6.4	1.4	2.2	0.4	50	15	I/O	Y
TLV225x	Wide voltage range	2, 4	N	2.7	16	0.0625	0.187	0.1	1.5	0.5	60	19	Out	Y
LMV324/LMV358	Low power	2, 4	N	2.7	5.5	0.25	1	1	7	5	250000	39	Out	Y
TLV27x	Wide voltage range, 3MHz	1, 2, 4	N	2.7	16	0.66	3	2.4	5	2	60	39	Out	Y
TLV2211	µPower, rail-rail out	1	N	2.7	10	0.025	0.065	0.025	3	0.5	150	22	Out	Preview
TL97x	Very low noise	1, 2, 4	N	2.7	12	3.2	12	5	6	5	750000	4	Out	Preview

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低功耗/宽电压范围运算放大器 

低功耗运算放大器选择指南 (Iq ≤ 1 mA)

Device[1]	Description	Ch.	SHDN	V_S (min) (V)	V_S (max) (V)	Iq per Ch. (max) (mA)	GBW (typ) (MHz)	Slew Rate (typ) (V/µs)	V_{IO} (25°C) (max) (mV)	Offset Drift (typ) (µV/°C)	I_B (max) (pA)	V_N at 1 kHz (typ) (nV/√Hz)	Rail-to-Rail	Auto Qual (Q1)
TLV240x	Wide voltage range, sub-µPower, RRIO	1, 2, 4	N	2.5	16	0.00095	0.0055	0.0025	1.2	3	300	—	I/O	Y
OPAy333	Zero drift	1, 2	N	1.8	5.5	0.017	0.35	0.16	0.01	0.02	200	1.1	I/O	Preview
TLV2211	µPower, rail-rail out	1	N	2.7	10	0.025	0.065	0.025	3	0.5	150	22	Out	Preview
TLV225x	Wide voltage range	2, 4	N	2.7	16	0.0625	0.187	0.1	1.5	0.5	60	19	Out	Y
TLC225x	µPower, rail-rail out	2, 4	N	4.4	16	0.0625	0.2	0.12	1.5	0.5	60	19	Out	Y
OPAy348	1MHz, 45µA, RRIO	1, 2, 4	N	2.1	5.5	0.065	1	0.5	5	2	10	35	I/O	Preview
TLV243x	RRIO	2, 4	N	2.7	10	0.125	0.5	0.25	2	2	300	18	I/O	Y
TLV2422	Low power, rail-rail output	2	N	2.7	10	0.075	0.052	0.02	2	2	60	23	Out	Y
LMV93x	1.8V with RRIO	1, 2, 4	N	1.8	5.5	0.185	1.4	0.35	4	5.5	65000	60	I/O	Y
LMV34x	Rail-rail output	1, 2, 4	N	2.5	5.5	0.2	1	1	4	1.7	120	40	Out	Y
LMV358	Low power	2	N	2.7	5.5	0.2	1	1	7	5	250000	46	Out	Y
TLC226x	Rail-rail output	2, 4	N	4.4	16	0.25	0.82	0.55	2.5	2	100	12	Out	Y
LMV32x	Low power	1, 2, 4	N	2.7	5.5	0.25	1	1	7	5	250000	39	Out	Y
TLE202x	Wide voltage range	1, 2, 4	N	4.0	40	0.3	1.2	0.5	0.6	2	70000	17	N	Y
LMV82x	Wide bandwidth	1, 2, 4	N	2.5	5.5	0.3	5	2.5	6	1	90000	45	Out	Y
TLV246x	Low noise, wide bandwidth, 25mA drive	1, 2, 4	Y	2.7	6.0	0.575	6.4	1.6	2	2	14000	11	I/O	Y
TLV237x	Wide voltage range, 3MHz	1, 2, 4	Y	2.7	16	0.66	3	2.4	4.5	2	60	39	I/O	Y
TLV27x	Wide voltage range, 3MHz	1, 2, 4	N	2.7	16	0.66	3	2.4	5	2	60	39	Out	Y
TLV247x	Low bias current, 35mA drive	1, 2, 4	Y	2.7	6.0	0.75	2.8	1.4	2.2	0.4	50	15	I/O	Y

[1]*x indicates: 0 = single with shutdown, 1 = single, 2 = dual, 3 = dual with shutdown, 4 = quad, 5 = quad with shutdown. y indicates: no character = single, 2 = dual, 3 = triple, 4 = quad.*

宽电压范围运算放大器选择指南(V_S ≤ 15 V)

Device[1]	Description	Ch.	V_S (min) (V)	V_S (max) (V)	Iq per Ch. (max) (mA)	GBW (typ) (MHz)	Slew Rate (typ) (V/µs)	V_{IO} (25°C) (max) (mV)	Offset Drift (typ) (µV/°C)	I_B (max) (pA)	CMRR (min) (dB)	V_N at 1 kHz (typ) (nV/√Hz)	Single Supply	Rail-to-Rail	Auto Qual (Q1)
TLE214x	High speed, single supply	1, 2, 4	4.0	44	4.5	5.9	45	0.9, 1.2, 2.4	1.7	1500000	85	10.5	Y	N	Preview
TLE202x	Precision, single supply, low power	1, 2, 4	4.0	40	0.3	1.2	0.5	0.6	2	70000	85	17	Y	N	Y
TLE207x	Low noise, high speed, JFET-input	1, 2	4.5	38	1.8	10	45	6	2.4	175	80	14	N	N	Y
TLE2037	Low noise, high speed, precision	1	8.0	38	5.3	50	7.5	0.1	0.4	90000	100	2.5	N	N	Y
TL347x	Enhanced general purpose	2, 4	4.0	36	4.5	4	13	12	10	500000	65	49	Y	N	Y
TL08x	JFET input, general purpose	1, 2, 4	7.0	36	2.8	3	13	15	18	400	70	18	N	N	Y
TLV240x	Sub-µPower, RRIO	1, 2, 4	2.5	16	0.00095	0.0055	0.0025	1.2	3	300	63	—	Y	I/O	Y
TLV225x	Low power, rail-rail out	2, 4	2.7	16	0.0625	0.2	0.1	1.5	0.5	60	65	19	Y	Out	Y
TLV27x	550µA/Ch, 3MHz, rail-rail out	1, 2, 4	2.7	16	0.66	3	1.4	5	2	60	58	39	Y	Out	Y
TLV237x	550µA, 3MHz	1, 2, 4	2.7	16	0.66	3	2.4	4.5	2	60	57	39	Y	I/O	Y
TLC225x	Low power, rail-rail out	2, 4	4.4	16	0.0625	0.2	0.1	1.5	0.5	60	70	19	Y	Out	Y
TLC227x	Low noise, rail-to-rail out	2, 4	4.4	16	1.5	2.2	3.6	2.5	2	60	70	9	Y	Out	Y
TLC226x	Low power, rail-rail out	2, 4	4.4	16	0.25	0.82	0.55	2.5	2	800	70	12	Y	Out	Y
TLC07x	Low noise, high drive	1, 2, 4	4.5	16	2.5	10	16	1.9	1.2	50	100	7	Y	N	Preview
TLC08x	Low noise, high drive, input range incl GND	1, 2, 4	4.5	16	2.5	10	16	1.9	1.2	50	70	8.5	Y	N	Y

[1]*x indicates: 0 = single with shutdown, 1 = single, 2 = dual, 3 = dual with shutdown, 4 = quad, 5 = quad with shutdown. y indicates: no character = single, 2 = dual, 3 = triple, 4 = quad.*

高速/多用途运算放大器

高速运算放大器选择指南(GBW ≥10 MHz)

Device[1]	Description	Ch.	V_S (min) (V)	V_S (max) (V)	Iq per Ch. (max) (mA)	GBW (typ) (MHz)	Slew Rate (typ) (V/μs)	V_{IO} (25°C) (max) (mV)	Offset Drift (typ) (μV/°C)	I_B (max) (pA)	CMRR (min) (dB)	V_N at 1 kHz (typ) (nV/√Hz)	Single Supply	Rail-to-Rail	Auto Qual (Q1)
THS4509	Wideband fully differential	1	3.0	5.5	38	3000	6600	1	2.6	13000	90	1.9	N	N	Preview
THS4041	165MHz C-stable, high output drive	1	9.0	32	10	165	400	13	10	—	70	14	N	N	Y
TLE2037	Low-noise, precision, wide voltage range	1	8.0	38	5.3	50	7.5	0.1	0.4	90000	100	2.5	N	N	Y
LM218	Wide voltage range	1	10	40	8	15	70	10	—	250000	80	—	N	N	Y
TL97x	Low voltage, low noise	1, 2, 4	2.7	12	3.2	12	5	6	5	750000	60	4	Y	Out	Preview
TLE207x	Low noise, JFET input	1, 2, 4	4.5	38	1.8	10	45	6	2.4	175	80	14	N	N	Y
TLC07x	Low noise, high drive	1, 2, 4	4.5	16	2.5	10	16	1.9	1.2	50	95	7	Y	N	Preview
TLC08x	Low noise, high drive, input range incl GND	1, 2, 4	4.5	16	2.5	10	16	1.9	1.2	50	70	8.5	Y	N	Y

[1]*x indicates: 0 = single with shutdown, 1 = single, 2 = dual, 3 = dual with shutdown, 4 = quad, 5 = quad with shutdown. y indicates: no character = single, 2 = dual, 3 = triple, 4 = quad.*

多用途运算放大器选择指南

Device[1]	Description	Ch.	V_S (V) (min)	V_S (V) (max)	Iq per Ch. (mA) (max)	GBW (MHz) (typ)	Slew Rate (V/μs) (typ)	V_{IO} (25°C) (mV) (max)	Offset Drift (μV/°C) (typ)	I_B (pA) (max)	CMRR (dB) (min)	V_N at 1 kHz (nV/√Hz) (typ)	Single Supply	Auto Qual (Q1)
LM218	High-speed op amp	1	10	40	8	15	70	10	—	250000	80	—	N	Y
LM2902	General purpose	4	3.0	26	0.3	1.2	0.5	7	7	250000	50	35	Y	Y
LM2902KV	Voltage enhanced, 2kV ESD	4	3.0	32	0.3	1.2	0.5	7	7	250000	50	35	Y	Y
LM2902KAV	Voltage enhanced, 2kV ESD, reduced V_{IO}	4	3.0	32	0.3	1.2	0.5	2	7	250000	50	35	Y	Y
LM2904	General purpose	2	3.0	26	0.6	0.7	0.3	7	7	250000	50	40	Y	Y
LM2904AV	Voltage enhanced, reduced V_{IO}	2	3.0	32	0.6	0.7	0.3	2	7	250000	65	40	Y	Y
LM2904V	Voltage enhanced	2	3.0	32	0.6	0.7	0.3	7	7	250000	65	40	Y	Y
LMV32x	Low voltage, rail-rail output	1, 2, 4	2.7	5.5	0.25	1	1	7	5	250000	50	39	Y	Y
LMV34x	Rail-rail output	1, 2, 4	2.5	5.5	0.2	1	1	4	1.7	120	56	40	Y	Y
LMV358	Low voltage, rail-rail output	2	2.7	5.5	0.2	1	1	7	5	250000	46	39	Y	Y
LMV82x	Low voltage, low power, rail-rail out	1, 2, 4	2.5	5.5	0.3	5	2.5	6	1	90000	45	42	Y	Y
LMV93x	1.8V with RRIO	1, 2, 4	1.8	5.5	0.185	1.4	0.35	4	5.5	65000	60	60	Y	Y
TL08x	Low noise, JFET input	1, 2, 4	7.0	36	2.8	3	13	15	18	400	70	18	N	Y
TL347x	Enhanced general purpose	2, 4	4.0	36	4.5	4	13	12	10	500000	65	49	Y	Y
TLC227x	Low noise, rail-rail out	2, 4	4.4	16	1.5	2.18	3.6	2.5	2	250000	80	9	Y	Y
TLV27x	550μA/Ch 3MHz rail-rail output	1, 2, 4	2.7	16	0.66	3	1.4	5	2	60	58	39	Y	Y

[1]*x indicates: 0 = single with shutdown, 1 = single, 2 = dual, 3 = dual with shutdown, 4 = quad, 5 = quad with shutdown. y indicates: no character = single, 2 = dual, 3 = triple, 4 = quad.*

比较器 

比较器选择指南

Device[1]	Description	Ch.	V_S (min) (V)	V_S (max) (V)	Iq per Ch. (max) (mA)	V_{IO} (25°C) (max) (mV)	t_{RESP} Low-to-High (µs)	Output Current (min) (mA)	Output Type	Auto Qual (Q1)
High Speed $t_{RESP} \le 0.2$ µs										
LM211	High speed, strobed	1	3.5	30	6	3	0.115	—	Open drain	Y
LMV331	Low voltage	1	2.7	5.5	0.1	7	0.2	10	Open drain	Y
LMV393	Low voltage	2	2.7	5.5	0.1	7	0.2	5	Open drain	Y
LMV339	Low voltage	4	2.7	5.5	0.1	7	0.2	10	Open drain	Preview
Low Power Iq < 0.5 mA										
TLV370x	Nanopower, push-pull, RRIO	1, 2, 4	2.5	16	0.0008	5	36	—	Push pull	Y
TLV3012A	SOT-23 comparator and voltage reference	1	1.8	5.5	0.005	12	6	—	Push pull	Preview
TLC370x	Fast, low power	2, 4	4.0	16	0.02	5	1	4	Push pull	Y
TLC393	General purpose, low power	2	4.0	16	0.02	5	1	6	Open drain	Y
TLC339	General purpose, low power	4	3.0	16	0.02	5	1	6	Open drain	Preview
LMV331	General purpose, low voltage	1	2.7	5.5	0.1	7	0.2	10	Open drain	Y
LMV393	General purpose, low voltage	2	2.7	5.5	0.1	7	0.2	5	Open drain	Y
LP2901	General purpose, low power	4	3.0	30	0.5	5	1.3	6	Open drain	Y
Wide Voltage Range $V_S \ge 16$ V										
LM2901V	Voltage enhanced	4	2.0	32	0.625	7	0.3	6	Open drain	Y
LM2901AV	Voltage enhanced, reduced V_{IO}	4	2.0	32	0.625	2	0.3	6	Open drain	Y
LM2903V	Voltage enhanced	2	2.0	32	0.5	7	0.3	6	Open drain	Y
LM2903AV	Voltage enhanced, reduced V_{IO}	2	2.0	32	0.5	2	0.3	6	Open drain	Y
LM2901	General purpose	4	2.0	30	0.625	7	0.3	6	Open drain	Y
LP2901	General purpose, low power	4	3.0	30	0.5	5	1.3	6	Open drain	Y
LM239A	General purpose	4	2.0	30	0.5	2.5	0.3	6	Open drain	Y
LM2903	General purpose	2	2.0	30	0.5	7	0.3	6	Open drain	Y
TLC370x	Fast, low power	2, 4	4.0	16	0.02	5	1.1	4	Push pull	Y
TLC393	General purpose, low power	2	4.0	16	0.02	5	1.1	6	Open drain	Y
TLC339	General purpose, low power	4	3.0	16	0.02	5	1	6	Open drain	Preview
TLV370x	Nanopower, push-pull, RRIO	1, 2, 4	2.5	16	0.0008	5	36	—	Push pull	Y

[1] *x indicates: 0 = single with shutdown, 1 = single, 2 = dual, 3 = dual with shutdown, 4 = quad, 5 = quad with shutdown. y indicates: no character = single, 2 = dual, 3 = triple, 4 = quad.*

低压降稳压器(LDO)

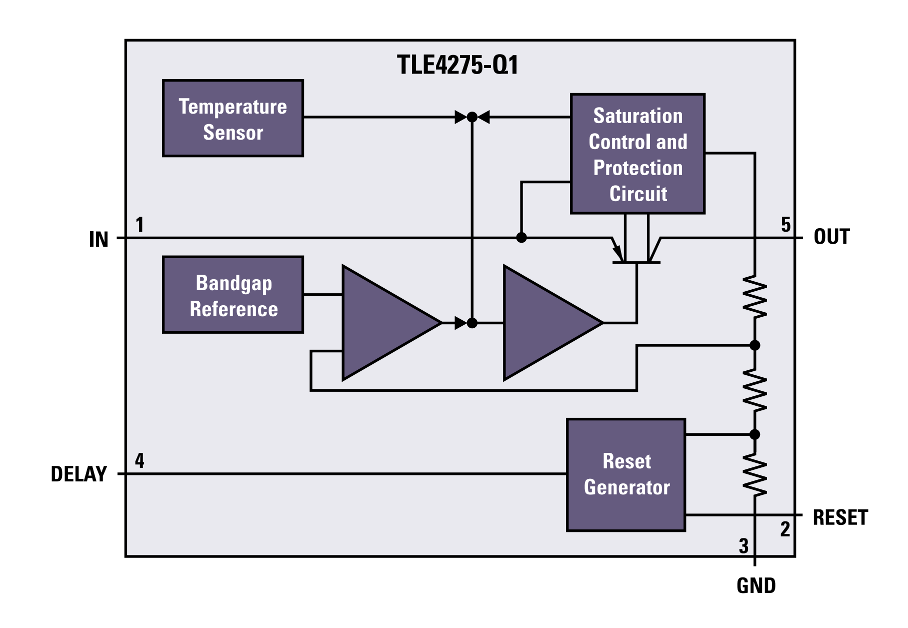
具有抛负载(Load-Dump)保护的高输出电压低压降稳压器
TLE4275-Q1

敬请访问**www.ti.com/sc/device/TLE4275-Q1**，以获取样片及数据表。

主要特点

- 输出电压：5V ±2%
- 超低电流损耗
- 上电复位及欠压(undervoltage)复位
- 复位低电平(<1V)输出电压
- 超低压降输出电压
- 短路保护
- 反极性保护
- 静电放电保护大于6 kV

TLE4275-Q1低压降稳压器(LDO)专门针对苛刻的汽车工作环境而设计。该器件可直接连接至汽车电池，可承受抛负载(load-dump)的瞬变状态。其输出稳定性也针对典型的汽车应用及低成本电容做了优化。



双输出低压降稳压器(LDO)选择指南

Device	Description	I_{O1} (mA)	I_{O2} (mA)	V_{DO1} @ I_{O1} (mV)	V_{DO2} @ I_{O2} (mV)	Iq @ I_O (µA)	Voltage (V)	Accuracy (%)	V_O (min) (V)	V_O (max) (V)	Features						Auto Qual (Q1)
											/EN	SVS	Seq	Low Noise	V_{IN} (min) (V)	V_{IN} (max) (V)	
TPS767D3xx	Dual-output, fast LDO with integrated SVS	1000	1000	350	—	125	3.3/2.5, 3.3/1.8, 3.3/Adj	2	1.2	5	✔	✔	—	—	2.7	10	Y
TPS70175	Dual-output LDO with power-up sequencing for split-voltage DSP systems	500	250	170	—	190	2.5/5.0	2	—	—	✔	✔	✔	✔	2.7	6	Y

标准线性稳压器选择指南

Device	V_{OUT} (nom) (V)	V_{OUT}/V_{REF} Tolerance Over Temp. (%)	I_{OUT} (max) (mA)	Min I_{OUT} for Regulation (mA)	Iq (max) (mA)	V_{DO} (typ) (V)	V_{DO} (max) (V)	V_{IN} (max) (V)	$V_{IN} - V_{OUT}$ (max) (V)	Auto Qual (Q1)
LM317M	Adj. (1.2 to 37)	0.7	500	3.5	—	—	3	—	40	Y
UA78Mxx	3.3, 5, 10	5	500	—	6	2	2 to 2.5	25 to 30	—	Y

低压降稳压器(LDO)



低压降稳压器(LDO)选择指南

Device	I_O (mA)	V_{DO} at I_O (typ) (mV)	Iq at I_O Full Load (μA)	Voltage (V)	Adj.	V_{IN} (min) (V)	V_{IN} (max) (V)	Accuracy (%)	Packages	Features[1]	Comments	Auto Qual (Q1)
TPS797xx	10	110	5	1.8, 3, 3.3	—	1.8	5.5	5, 4, 4	SC70	PG	Low quiescent current	Y
TPS715xx	50	415	3.2	2.5, 3, 3.3, 5	—	2.5	24	4	SC70	—	Low quiescent current	Y
TPS770xx	50	48	17	1.2, 1.5, 1.8, 2.5, 2.7, 2.8, 3, 3.3, 5	✔	2.7	10	3	SOT23	/EN	Low quiescent current	Y
TPS769xx	100	70	17	1.2, 1.5, 1.8, 2.5, 2.7, 2.8, 3, 3.3, 5	✔	2.7	10	3	SOT23	/EN	Low cost	Y
TPS791xx	100	38	170	1.8, 3.3, 4.7	✔	2.7	5.5	2	SOT23	/EN	RF low noise; high PSRR	Y
TPS731xx	150	30	400	1.5, 1.8, 2.5 3.0, 3.3, 5.0	✔	1.7	5.5	1	SOT23	/EN	Reverse leakage protection	Preview
TPS763xx	150	300	85	1.6, 1.8, 2.5, 2.7, 2.8, 3, 3.3, 3.8, 5	✔	2.7	10	3	SOT23	/EN	Low cost	Y
TPS765xx	150	85	33	1.5, 1.8, 2.5, 2.7, 2.8, 3, 3.3, 5	✔	2.7	10	3	SO8	/EN	Low quiescent current	Preview
TPS771xx	150	265	125	1.5, 1.8, 2.7, 2.8, 3.3, 5	✔	2.7	10	2	MSOP	PG, /EN	Fast transient response	Y
TPS793xx	200	100	170	1.8, 2.5, 2.8, 2.85, 3, 3.3, 4.75	✔	2.7	5.5	2	SOT23, MSOP, SOT223	EN	RF low noise, high PSRR	Y
TPS799xx	200	100	40	1.2 to 6	✔	2.7	6.5	2	SOT23	/EN	High PSRR	Preview
TPS732xx	250	40	400	1.2, 1.5, 1.6, 1.8, 2.5, 3, 3.3, 5	✔	1.7	5.5	1	SOT23	/EN	Reverse current protection Cap free	Y
TPS773xx	250	150	90	1.5, 1.6, 1.8, 2.7, 2.8, 3.3, 5.0	✔	2.7	10	2	MSOP	/EN, SVS	Low noise	Preview
TLE4275	450	500	150	5	—	5.5	45	2	DDPAK	V, LD, RST	Automotive LDO	Y
TL760Mxx	500	500	—	1.8, 2.5, 3.3	—	3	45	2	DDPAK	V, LD	Automotive LDO, TLE4274 alternative	Y
TPS71Hxx	500	150	285	3.3, 4.85, 5.0	✔	4.3	10	2	PWP	PG	Fast transient response	Y
TPS775xx	500	169	85	1.5, 1.6, 1.8, 2.5, 3.3	✔	2.7	10	2	SO8, PWP	SVS	Fast transient response	Y
TPS776xx	500	169	85	1.5, 1.8, 2.5, 2.8, 3.3	✔	2.7	10	2	SO8, PWP	PG	Fast transient response	Y
TL720Mxx	450	500	—	5	—	5.5	42	2	TO263, TO252	V	Reverse polarity protection	Y
TL750Mxx	750	600	—	5, 8, 12	—	6, 9, 13	60	3	DDPAK	V, LD	Automotive LDO, TLE4275 alternative	Y
TL751Mxx	750	600	—	5, 8, 12	—	6, 9, 13	60	3	DDPAK	V, LD, /EN	Automotive LDO	Y
TPS725xx	1000	170	75	1.5, 1.6, 1.8, 2.5	✔	1.8	6	2	SO8	/EN, SVS	Low noise, SVS	Preview
TPS767xx	1000	230	85	1.5, 1.8, 2.5, 2.7, 2.8, 3, 3.3, 5	✔	2.7	10	2	SO8, PWP	SVS	Fast transient response	Y
TPS768xx	1000	230	85	1.5, 1.8, 2.5, 2.7, 2.8, 3, 3.3, 5	✔	2.7	10	2	SO8, PWP	PG	Fast transient response	Y
TPS753xx	1500	160	75	1.5, 1.8, 2.5, 3.3	✔	2.7	5	2	PWP	/EN, SVS	Fast transient response	Y
TPS786xx	1500	580	385	1.8, 2.5, 2.8, 3.0, 3.3	✔	2.7	5.5	3	DDPAK	/EN	Low noise	Preview
TPS752xx	2000	210	75	1.5, 1.8, 2.5, 3.3	✔	2.7	5	2	PWP	/EN, SVS	Fast transient response	Y

[1]*V = wide voltage, LD = load dump, PG = power good, /EN = active high enable, SVS = supply voltage supervisor, RST = reset.*

直流/直流(DC/DC)控制器及转换器

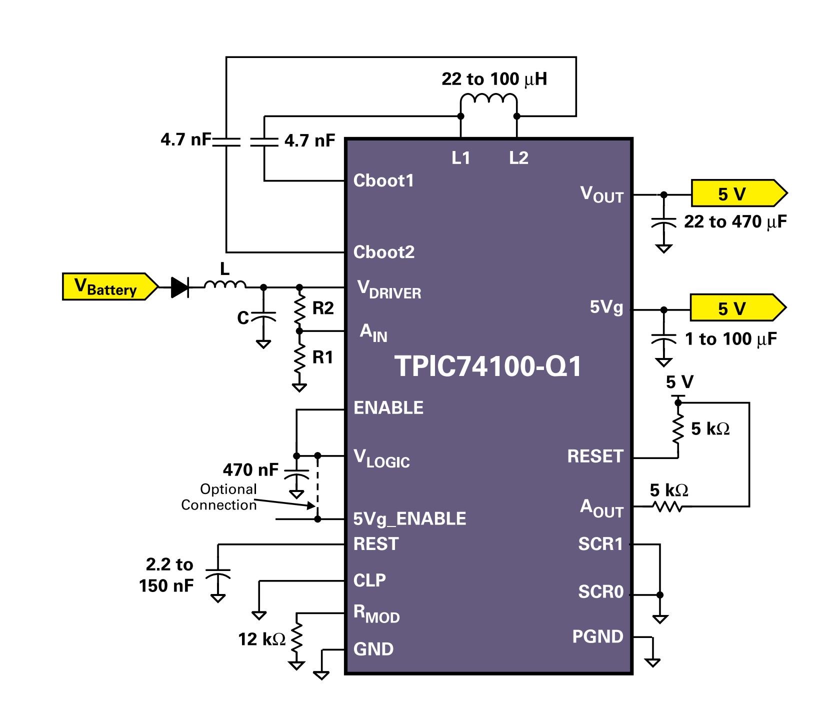
具有扩展温度范围的集成 5V输出降压/升压转换器 TPIC74100-Q1

敬请访问**www.ti.com/sc/device/TPIC74100-Q1**，以获取样片及数据表。

TI的TPIC74100-Q1是针对汽车应用的5V固定输出降压/升压转换器，具有固定的440kHz转换频率。该器件的集成功率开关具有1A的负载电流驱动能力，其宽输入电压范围从1.5V至40V，甚至在冷启动(cold crank)及抛负载(load-dump)状态下也能工作。TPIC74100还具有低功耗运转及待机模式，从而使其更为适用于极为注重功耗的应用。

主要特点

- 5V输出，输出精度为±2%
- 运转电压输入范围：1.5V至40V
- 负载电流驱动能力：1A
- 440kHz转换频率，带扩频(spread spectrum)功能
- 低功耗运转及待机模式
- 辅助的5V转换输出
- 可编程的转换速率(slew rate)及复位延迟



开关直流/直流转换器选择指南

Device	V_{IN} (V)	V_O (max) (V)	V_O (min) (V)	V_{REF} Tol (%)	Driver Current (A)	Auto Qual (Q1)	Comments
MC33063A	3 to 40	40	1.25	2	1.5	Y	1.5-A peak boost/buck/inverting switching regulator
TPIC74100	1.5 to 40	5	5	2	1	Y	Buck/boost switch-mode regulator
TPS61040	1.8 to 6.0	28	V_{IN}	—	0.09	Y	Boost mode, LED driver
TPS61041	1.8 to 6.0	28	V_{IN}	—	0.05	Y	Boost mode

开关直流/直流控制器选择指南

Device	V_{IN} (V)	V_O (max) (V)	V_O (min) (V)	V_{REF} Tol (%)	Driver Current (A)	Output Current (A)[1]	Multiple Outputs	Adaptive Voltage Positioning	Protection[2]	Auto Qual (Q1)	Comments
TPS40050	8 to 40	30	0.7	1	1	20	No	No	OCP, UVLO	Y	Wide input range sync buck, source only
TPS40051	8 to 40	30	0.7	1	1	20	No	No	OCP, UVLO	Y	Wide input range sync buck, source/sink except SS
TPS40053	8 to 40	30	0.7	1	1	20	No	No	OCP, UVLO	Y	Wide input range sync buck, source/sink
TPS40057	8 to 40	35	0.7	1	1	20	No	No	SCP, UVLO	Y	Wide input range sync buck, source/sink with prebias
TPS5120	4.5 to 30	26	0.9	1.5	1.5	15 (each)	Yes	No	OCP, UVLO, PG, OVP	Y	Dual 180 degree out-of-phase operation
TL1451A	3.6 to 50	50	2.5	4	0.02	Depends on FET driver	Yes	No	UVLO, SCP	Y	Dual PWM buck/boost
TL5001A	3.6 to 40	50	1	3	0.02	Depends on FET driver	No	No	UVLO, SCP	Y	PWM buck/boost
TPS40200	4.5 to 52	46	0.7	2	0.2	Depends on FET driver	No	No	—	Y	Wide input non-synchronous buck DC/DC controller

[1]Current levels of this magnitude and beyond can be supported.
[2]OCP = over-current protection; UVLO = under-voltage lockout; SCP = short-circuit protection; PG = power good; OVP = over-voltage protection.



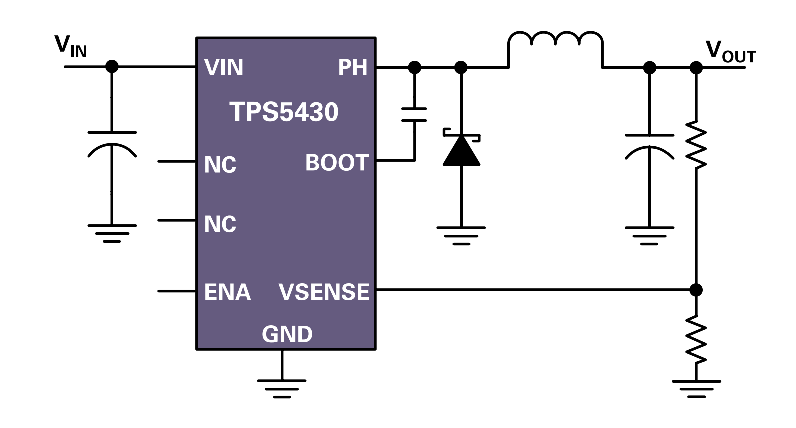
直流/直流(DC/DC)控制器及转换器

3A、宽输入范围步降SWIFT™转换器
TPS5430-Q1

敬请访问**www.ti.com/sc/device/TPS5430-Q1**，以获取样片、数据表、评估板及应用报告。

主要特点

- 宽输入电压范围：5.5V至36V
- 高达3A的持续电流输出能力（峰值为4A）
- 110-mΩ集成MOSFET开关，使得效率可高达95%
- 宽输出电压范围：可调节低至1.22V，初始精度为1.5%
- 内置补偿，最大程度的降低了外部原件数量
- 固定的500kHz转换频率，以实现滤波器的尺寸的缩小
- 通过输入电压前馈(feed forward)改善了线路稳压及瞬态响应
- 系统过电流限制、过电压保护及热关断保护



SWIFT™ 步降转换器选择指南

Device	V_{IN} (V)	Output Current (A)	V_{OUT} (V)	Pin # / Pkg	Auto Qual (Q1)
TPS62000/1/2/3/4/5/6/7/8	2.0 to 5.5	0.6	Adj., 0.9, 1.0, 1.2, 1.5, 1.8, 1.9, 2.5, 3.3	10/MSOP	Y
TPS5410	5.5 to 36	1	1.23 to 31	8/SO	Preview
TPS62042	2.5 to 6.0	1.2	1.5	10/MSOP	Preview
TPS54110	3.0 to 6.0	1.5	0.9 to 4.5	20/HTSSOP	Preview
TPS5420	5.5 to 36	2	Adj	8/SO	Y
TPS5430	5.5 to 36	3	Adj	8/HSO	Y
TPS54310/1/2/3/4/5/6	3.0 to 6.0	3	Adj., 0.9, 1.2, 1.5, 1.8, 2.5, 3.3	20/HTSSOP	Y
TPS54380	3.0 to 6.0	3	0.9 to 4.5	20/HTSSOP	Preview
TPS5450	5.5 to 36	5	Adj	8/HSO	Preview
TPS54372	3.0 to 6.0	6	0.2 to 4.5	20/HTSSOP	Y
TPS54610/1/2/3/4/5/6	3.0 to 6.0	6	Adj., 0.9, 1.2, 1.5, 1.8, 2.5, 3.3	28/HTSSOP	Y
TPS54680	3.0 to 6	6	0.9 to 4.5	28/HTSSOP	Y

无电感直流/直流(DC/DC)稳压器（充电泵）选择指南

Device	I_{OUT} (mA)	V_{IN} (V)	V_{OUT} Adj. (V)	Efficiency (%)	Switching Frequency (max) (kHz)	Quiescent Current (typ) (µA)	Auto Qual (Q1)
TPS60400	60	1.6 to 5.5	– (1.6 to 5.5)	99	375	125	Y
TPS60401	60	1.6 to 5.5	– (1.6 to 5.5)	99	30	65	Y
TPS60402	60	1.6 to 5.5	– (1.6 to 5.5)	99	75	120	Y
TPS60403	60	1.8 to 5.25	– (1.8 to 5.25)	90	325	425	Y

LCD/LED显示器偏压解决方案选择指南

Device	V_{IN} (min) (V)	V_{IN} (max) (V)	No. of Regulated Outputs	Minimum Switch Current Limit (A)	LDO	DC/DC Converter	Charge Pump	Pin # / Pkg	Operating Temp Range (°C)	Auto Qual (Q1)
TPS65140	2.7	5.8	4	1.6	1	1	2	24/HTSSOP	–40 to 85	Y
TPS65145	2.7	5.8	4	0.96	1	1	2	24/HTSSOP	–40 to 85	Y

LED驱动器

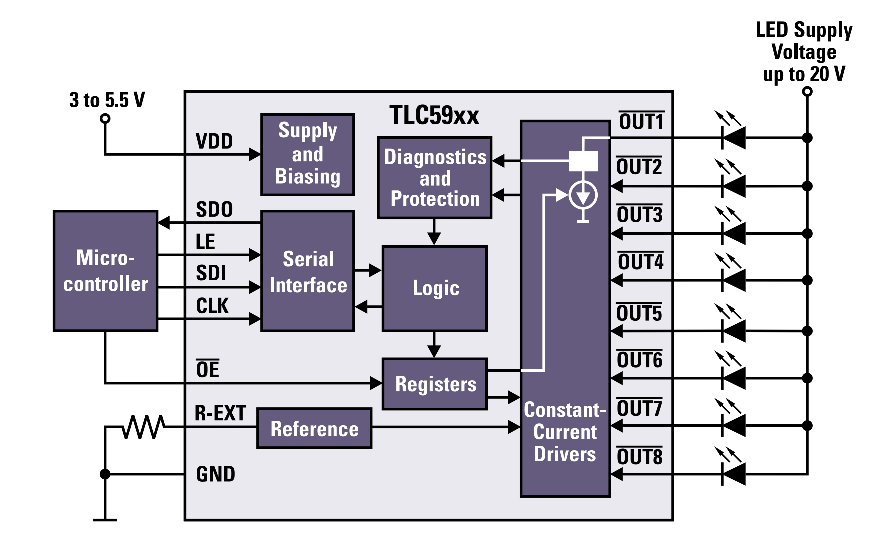
8位恒定电流吸收LED驱动器
TLC5917

敬请访问**www.ti.com/sc/device/TLC5917-Q1**，以获取样片及数据表。

主要特点

- 恒定输出电流范围：5mA至120mA
- 可编程总电流增益：256级
- 卓越的输出电流精度：
  - 通道间误差：< ±3%（最大值）
  - 器件间误差：< ±6%（最大值）
- 时钟频率：30 MHz
- 施密特触发器输入
- 电源电压：3.3V或5 V

TLC5917设计用于LED显示器及LED灯光照明应用，具有恒定电流控制以及负载开路、负载短路及过热检测。该器件具有一个8位的移位寄存器及数据锁存，可将串行输入数据转换为并行输出格式。在输出级，八个稳流端口设计用于提供一致的恒定电流，以实现宽范围的可变正向压降下的LED驱动。



LED驱动器选择指南

Device	V_{IN} (V)	Type	V_{OUT} (max) (V)	LED Configuration	No. of Channels	Max Current (mA)	Dimming[1]	Serial Interface	Diagnostics[2]	Protection[2]	Pin # / Pkg	Auto Qual (Q1)	Comments
TPS61040	1.8 to 6.0	Inductive	28	Series	1	400	Y	N	—	SS, UVLO	SOT-23	Y	DC/DC boost converter for white LEDs
TPS61041	1.8 to 6.0	Inductive	28	Series	1	250	Y	N	—	SS, UVLO	SOT-23	Y	DC/DC boost converter for white LEDs
TPIC6C595/6	4.5 to 5.5	Switch	33	Parallel	8	250	Y	Y	—	OC	16/TSSOP, 16/SO	N	Power logic multichannel switch
TPIC2810	3.0 to 5.5	Switch	40	Parallel	8	210	Y	Y	—	OT, IL	16/SO	N	Power logic multichannel switch
TLC5916	3.0 to 5.5	Linear	20	Parallel	8	120	Y	Y	OL, OT	OT	16/TSSOP, 16/SO	Y	Linear multichannel constant current sink
TLC5917	3.0 to 5.5	Linear	20	Parallel	8	120	Y	Y	OL, OT, SC	OT	16/TSSOP, 16/SO	Y	Linear multichannel constant current sink
TLC5940	3.0 to 5.5	Linear	18	Parallel	16	120	Y	Y	OL, OT	OT	28/HTSSOP	Preview	Linear multichannel constant current sink

[1]*May be via ENABLE pin, CONTROL pin, analog feedback network or programmable per serial interface.*
[2]*SS = soft start; UVLO = under-voltage lockout; OC = over current; OT = over temperature; IL = current limit; OL = open load; RB = reverse battery; SC = shorted load.*

脉宽调制(PWM)电源控制器/USB电源开关



PWM 电源控制器选择指南

Device[1]	Typical Power Level (W)	Max Practical Frequency	Start-Up Current	Operating Current	Supply Voltage (V)	UVLO: On/Off (V)	V_{REF} (V)	V_{REF} Tol. (%)	Max Duty Cycle (%)	Soft Start	E/A	Shutdown	Output Voltage Feed-forward	Leading Edge Blanking	Auto Qual (Q1)
Peak Current Mode Controllers															
UCC2800	10 to 200	1MHz	100µA	500µA	7.2 to 15	7.2/6.9	5	1.5	100	Yes	Yes	No	No	100 ns	Y
UCC2801	10 to 200	1MHz	100µA	500µA	9.4 to 15	9.4/7.4	5	1.5	50	Yes	Yes	No	No	100 ns	Y
UCC2802	10 to 200	1MHz	100µA	500µA	12.5 to 15	12.5/8.3	5	1.5	100	Yes	Yes	No	No	100 ns	Y
UCC2803	10 to 200	1MHz	100µA	500µA	4.1 to 15	4.1/3.6	4	1.5	100	Yes	Yes	No	No	100 ns	Y
UCC2804	10 to 200	1MHz	100µA	500µA	12.5 to 15	12.5/8.3	5	1.5	50	Yes	Yes	No	No	100 ns	Y
UCC2805	10 to 200	1MHz	100µA	500µA	4.1 to 15	4.1/3.6	4	1.5	50	Yes	Yes	No	No	100 ns	Y
UCC2808A-1/A-2	50 to 500	1MHz	130µA	1mA	4.3 to 15	12.5/8.34/4.1	—	—	Prog	Yes	Yes	No	No	No	Y
UCC2813-0	10 to 200	1MHz	100µA	500µA	7.2 to 15	7.2/6.9	5	1.5	100	Yes	Yes	No	No	100 ns	Y
UCC2813-1	11 to 200	1MHz	100µA	500µA	9.4 to 15	9.4/7.4	5	1.5	50	Yes	Yes	No	No	100 ns	Y
UCC2813-2	12 to 200	1MHz	100µA	500µA	12.5 to 15	12.5/8.3	5	1.5	100	Yes	Yes	No	No	100 ns	Y
UCC2813-3	13 to 200	1MHz	100µA	500µA	4.1 to 15	4.1/3.6	4	1.5	100	Yes	Yes	No	No	100 ns	Y
UCC2813-4	14 to 200	1MHz	100µA	500µA	12.5 to 15	12.5/8.3	5	1.5	100	Yes	Yes	No	No	100 ns	Y
UCC2813-5	15 to 200	1MHz	100µA	500µA	4.1 to 15	4.1/3.6	4	1.5	100	Yes	Yes	No	No	100 ns	Y
UCC2895	—	1MHz	150µA	5mA	9 to 17	11/9	5	1.2	100	Yes	Yes	No	No	No	Preview
UCC28220	—	2MHz	200µA	3.5mA	8 to 14.5	10/8	—	—	90	Yes	No	No	No	No	Preview
UC2524A	50 to 500	450kHz	4mA	5mA	8 to 40	7.5/7	5	2	Prog	Yes	Yes	Yes	No	No	Preview
UC2825A	—	1MHz	100µA	—	22	16/10	5	1	50	Yes	Yes	No	No	Yes	Y
UC2842A	30 to 350	500kHz	0.3mA	11mA	10 to 30	16/10	5	1.5	100	No	Yes	No	Yes	No	N
UC2843A	30 to 350	500kHz	0.mA	11mA	7.8 to 30	8.5/7.9	5	1.5	100	No	Yes	No	Yes	No	Y
UC2844A	30 to 350	500kHz	0.3mA	11mA	10 to 30	16/10	5	1.5	50	No	Yes	No	Yes	No	N
UC2845A	30 to 350	500kHz	0.3mA	11mA	7.8 to 30	8.5/7.9	5	1.5	50	No	Yes	No	Yes	No	N
UC2856	—	1MHz	—	18mA	7.7 to 40	7.7	5	1	50	Yes	Yes	Yes	No	No	Preview

[1]*The extra "C" in UCC means BiCMOS technology; therefore, UC2842 is bipolar and UCC2800 is BiCMOS.*

USB电源开关选择指南

Device	V_{IN} (min) (V)	V_{IN} (max) (V)	$r_{DS(on)}$ per FET (typ) (mΩ)	Pin # / Pkg	Operating Temp Range (°C)	Continuous Current (max) (A)	Current Limit (typ) (A)	Number of Switches	Enable	Auto Qual (Q1)
TPS2022	2.7	5.5	33	8/SO	–40 to 85	1	1.5	1	Low	Y
TPS2024	2.7	5.5	33	8/SO	–40 to 85	2	3	1	Low	Y
TPS2030	2.7	5.5	33	8/SO	–40 to 85	0.2	0.3	1	High	Y
TPS2042B	2.7	5.5	70	8/SO	–40 to 125	0.5	1	2	Low	Y
TPS2051B	2.7	5.5	70	8/SO	–40 to 125	0.5	1	1	High	Y

USB瞬间电压干扰抑制器选择指南

Device	Supply Voltage (V)	Number of USB Ports	Peak Power Dissipation (W)	Stand-off Voltage (min) (V)	Operating Temp Range (°C)	Pin # / Pkg	Auto Qual (Q1)
SN65220[1]	3.3	1	60	6	–40 to 85	6/SOT-23	Y

[1]*USB 1.1 compatible.*

监控器/基准

监控器选择指南

Device	Number of Supervisors	Supervised Voltages	Pin # / Pkg	I_{DD} (typ) (µA)	Time Delay (ms)	Manual Reset Input/MR	Active-High Reset Output	Watchdog Timer WDI	Auto Qual (Q1)
TLC77xx	1	Adj./2.5/3.3/5.0	8/TSSOP	9	Prog	—	✔	—	Y
TPS3306	2	1.5/1.8/2.0/2.5/3.3	8/SO	15	100	—	—	✔	Y
TPS3307	3	1.8/2.5/3.3	8/SO	40	200	✔	✔	—	Y
TPS3803	1	Adj./1.5	5/SC-70	3	0.0055	✔	—	—	Y
TPS3805	2	Adj./3.3	5/SC-70	3	0.0055	✔	—	—	Y
TPS3808	1	Adj./3.0/3.3	SOT-23	3	Prog	✔	—	—	Y
TPS3809	1	2.5/3.0/3.3/5.0	3/SOT-23	9	200	—	—	—	Y
TPS3813	1	2.25/2.64/2.93/4.55	6/SOT-23	9	25	—	✔	✔	Preview
TPS3820/8-xx	1	3.3/5.0	5/SOT-23	15	25/200	✔	—	✔	Y
TPS3823	1	2.5/3.0/3.3/5.0	5/SOT-23	15	200	✔	—	✔	Y
TPS3824-xx	1	2.5/3.0/3.3/5.0	5/SOT-23	15	200	—	✔	✔	Y
TPS3825-xx	1	3.3/5.0	5/SOT-23	15	200	✔	✔	—	Y
TPS3836/8	1	1.8/2.5/3.0/3.3	5/SOT-23	0.25	10/200	✔	✔	—	Y
TPS3837	1	1.8/2.5/3.0/3.3	5/SOT-23	0.25	10/200	✔	—	—	Y
UCC2946	1	Adj.	8/TSSOP	12	Prog	✔	—	✔	Y

All devices feature an Active-Low Reset Output, except TPS3837.

基准选择指南

Device	V_O (V)	Initial Accuracy @ 25°C (%)	Temp Coeff (max) (ppm/°C)	I_{OUT}/I_Z (max) (mA)	Iq (max) (µA)	V_I (min) (V)	V_I (max) (V)	Pin # / Pkg	Operating Temp Range (°C)	Auto Qual (Q1)
Low-Noise, Very Low-Drift, Precision Series Voltage References										
REF5020A	2.048	0.01	8	10	1000	2.7	18	8/SO	–40 to 125	Preview
REF5025A	2.5	0.01	8	10	1000	2.7	18	8/SO	–40 to 125	Preview
REF5030A	3	0.01	8	10	1000	3.2	18	8/SO	–40 to 125	Preview
REF5040A	4.096	0.01	8	10	1000	4.296	18	8/SO	–40 to 125	Preview
REF5045A	4.5	0.01	8	10	1000	4.7	18	8/SO	–40 to 125	Preview
REF5050A	5	0.01	8	10	1000	5.2	18	8/SO	–40 to 125	Preview
TL1431	2.5 to 36	0.4	—	100	2	2.49	2.51	8/SO	–40 to 125	Y
TL431A	2.5 to 36	1	—	—	0.5	2.47	2.52	3/SOT-23, 5/SOT-23	–40 to 125	Y
TL431B	2.5 to 36	0.5	—	—	0.5	2.48	2.51	3/SOT-23	–40 to 125	Y
TL4050B	2.048 to 10	0.2	50	15	—	—	—	5/SC70	–40 to 125	Preview

Power + Logic™：8位器件选择指南

Device	Description	V_{DS} (max) (V)	I_{CC} (typ) (µA)	I_O (A)	I_{PEAK} (A)	$r_{DS\,(on)}$ (typ) (W)	E_{AS} (max) (mJ)	t_{PLH} (typ) (ns)	ESD (max) (kV)	Pin # / Pkg
TPIC6259	Addressable latch	45	15	0.25	0.75	1.3	75	625	3	20/SO (DW), 20/PDIP (N)
TPIC6273	D-type latch	45	15	0.25	0.75	1.3	75	625	3	20/SO (DW), 20/PDIP (N)
TPIC6595	Shift register	45	15	0.25	0.75	1.3	75	650	3	20/SO (DW), 20/PDIP (N)
TPIC6596	Shift register	45	15	0.25	0.75	1.3	75	650	3	20/SO (DW), 20/PDIP (N)
TPIC6A259[1]	Addressable latch	50	500	0.35	1.1	1	75	125	2.5	24/SO (DW), 20/PDIP (NE)
TPIC6A595[1]	Shift register	50	500	0.35	1.1	1	75	125	2.5	24/SO (DW), 20/PDIP (NE)
TPIC6B259[2]	Addressable latch	50	20	0.15	0.5	5	30	150	2.5	20/SO (DW), 20/PDIP (N)
TPIC6B273[2]	D-type latch	50	20	0.15	0.5	5	30	150	2.5	20/SO (DW), 20/PDIP (N)
TPIC6B595[2]	Shift register	50	20	0.15	0.5	5	30	150	2.5	20/SO (DW), 20/PDIP (N)
TPIC6B596[2]	Shift register	50	20	0.15	0.5	5	30	150	2.5	20/SO (DW), 20/PDIP (N)
TPIC6C595[2]	Sift register	33	20	0.1	0.25	7	30	80	2.5	16/SO (D), 16/PDIP (N), 16/TSSOP (PW)
TPIC6C596[2]	Shift register	33	20	0.1	0.25	7	30	80	2.5	16/SO (D), 16/PDIP (N), 16/TSSOP (PW)
TPIC2810[2]	Shift register	40	620	0.1	0.21	5	—	1150	3	16/SO (D)

[1]*Fault protection and diagnosis.* [2]*Fault protection.*

混合信号供电+控制选择指南

Device	Description	V_{BAT} Range (V)	V_{OS} (max) (V)	I_D/I_{PEAK} (A)	$r_{DS(on)}$ (typ) (W)	Freq (kHz)	Pin # / Pkg
TPIC2603[1]	6-channel serial interface low-side controller	5.5 to 25	68	0.35/2.25	0.7	4000	20/PDIP (NE), 24/SO (DW)
Device	**Description**	**V_{BAT} Range (V)**	**I_{BAT} (typ) (mA)**	**I_{GD} (max) (mA)**	**f_{OSC} (typ) (kHz)**	**t_r/t_f (max) (µs)**	**Pin # / Pkg**
TPIC2101[2]	DC brush motor controller	0 to 16	4	50	20	1/0.8	14/SO (D), 14/PDIP (N)
Device	**Description**	**V_{CC} Range (V)**	**$V_{IT\pm}$ (HL) Range (mA)**	**$I_{(LGX/UGX)}$ (typ) (mA)**	**f_{PWM} (typ) (kHz)**	**f_{OSC}/f_{OSC1} (max) (MHz)**	**Pin # / Pkg**
TPIC43T01[2]	Three-phase DC brushless motor RPM controller	18 to 28	±4 to ±12	±10	22.7	10/10	38/TSSOP (DA)
TPIC43T02[2]	Three-phase DC brushless motor RPM controller	18 to 28	±4 to ±12	±10	22.7	10/10	38/TSSOP (DA)
Device	**Description**	**V_{BAT} Range (V)**	**V_{GATE} Range (V)**	**I_{BAT} (typ) (mA)**	**f_{SCLK} (max) (mHz)**	**Pin # / Pkg**	
TPIC44H01[1]	4-channel serial/parallel high-side FET pre-driver	8 to 24	VBAT+4 to VBAT+18	4	5	38/TSSOP (DA)	
TPIC44L01[1]	4-channel serial/parallel low-side FET pre-driver	8 to 24	7 to 13.5	0.5	10	24/SSOP (DB)	
TPIC44L02[1]	4-channel serial/parallel low-side FET pre-driver	8 to 24	7 to 13.5	0.5	10	24/SSOP (DB)	
TPIC44L03[1]	4-channel serial/parallel low-side FET pre-driver	8 to 24	7 to 13.5	0.5	10	24/SSOP (DB)	
TPIC46L01[1]	6-channel serial/parallel low-side FET pre-driver	8 to 24	7 to 13.5	0.5	10	24/SSOP (DB)	
TPIC46L02[1]	6-channel serial/parallel low-side FET pre-driver	8 to 24	7 to 13.5	0.5	10	24/SSOP (DB)	
TPIC46L03[1]	6-channel serial/parallel low-side FET pre-driver	8 to 24	7 to 13.5	0.5	10	24/SSOP (DB)	

[1]*Fault protection and diagnosis.* [2]*Fault protection.*

外设驱动器及制动器选择指南

Device	Description	Output Voltage (max) (V)	Switching Voltage (V)	Peak Output Current (mA)	Drivers per Package	Input Compatibility	Delay Time (typ) (ns)	Operating Temp Range (°C)	Pin # / Pkg	Auto Qual (Q1)
ULQ2003A	High-voltage, high-current Darlington transistor array	50	50	500	7	CMOS, TTL	1000	–40 to 125	16/SO	Y
ULQ2004A	High-voltage, high-current Darlington transistor array	50	50	500	7	CMOS	1000	–40 to 105	16/SO	Y

控制器局域网/局域网互联(CAN/LIN)

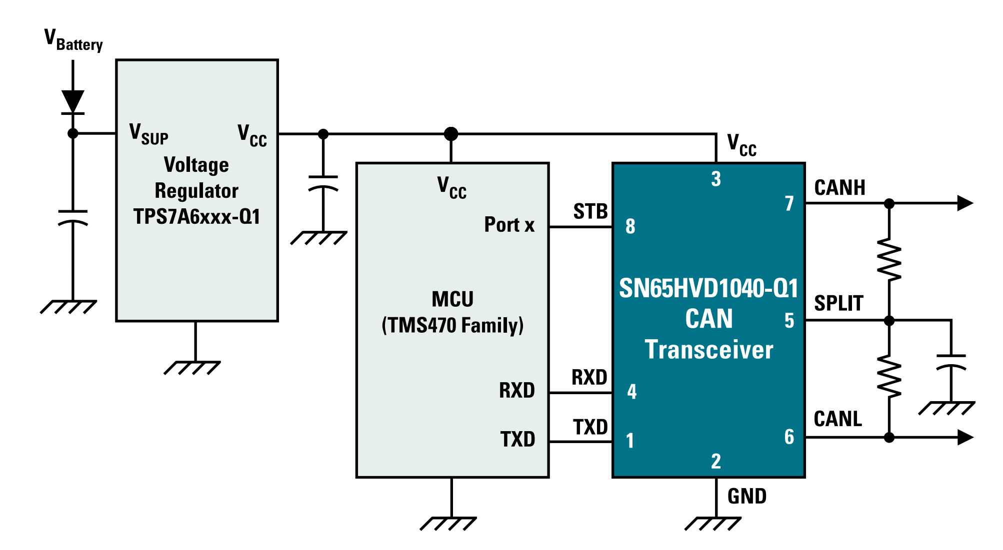
带唤醒(Wake UP)功能的高速控制器局域网收发机
SN65HVD1040-Q1

敬请访问**www.ti.com/sc/device/SN65HVD1040-Q1**，以获取样片及数据表。

主要特点

- 高速(1 Mbps)
- 兼容ISO 11898-5
- 带唤醒功能的超低功耗待机模式（12 μA最大值）
- 总线引脚短路保护：–27V至+40 V
- 未供电节点不会扰乱总线
- 支配超时(Dominant time-out)保护
- 在总线引脚具有高达±8 kV的静电放电(ESD)保护（人体模型）

TI的SN65HVD1040-Q1控制器局域网(CAN)收发机针对电磁干扰(EMC)进行了优化，具有宽共模电压范围，并具有线路跨接(cross-wire)、过电压、虚接地(loss-of-ground)以及过热状态保护。SN65HVD1040-Q1还可经受严重的电压瞬变，其强健性(ruggedness)及高达1Mbps的信号率使其可理想的适用于汽车应用。



CAN/LIN选择指南

Device	CAN/LIN Physical Layer Standard	Maximum Signaling Rate	Supply Voltage (V)	Maximum Junction Temp T_J (°C)	HBM Bus Pin ESD (kV)	Maximum Loop Delay (ns)	Bus Pin Standoff Voltage (V)	Bus Wake-Up	Typical I_{CC} in Low-Power Mode (µA)	Auto Qual (Q1)	Pin # / Pkg
SN65HVD1040-Q1	ISO-11898-5	1Mbps	5	150	±8	230	–27 to +40	Y	6	Y	8/SO (D)
SN65HVD1050-Q1	ISO-11898-2	1Mbps	5	150	±8	230	–27 to +40	N/A	N/A	Y	8/SO (D)
SN65HVD1040V33-Q1	ISO-11898-5	1Mbps	5, 3.3	150	±8	230	–27 to +40	Y	6	Preview	8/SO (D)
SN65HVD251-Q1	ISO-11898-2	1Mbps	5	150	±9	150	±36	N	190	Y	8/SO (D)
SN65HVD230Q-Q1	ISO-11898-2	1Mbps	3.3	150	±15	135	–2 to +7	Y	370	Y	8/SO (D)
SN65HVD231Q-Q1	ISO-11898-2	1Mbps	3.3	150	±15	135	–2 to +7	N	0.1	Y	8/SO (D)
SN65HVD232Q-Q1	ISO-11898-2	1Mbps	3.3	150	±15	135	–2 to +7	N/A	N/A	Y	8/SO (D)
TPIC1021	LIN 2.0 / 2.1	20kbps	Vbat	150	±12	N/A	–40 to +40	Y	20	Y	8/SO (D)
TPIC1021E-Q1	LIN 2.0 / 2.1	20kbps	Vbat	150	±12	N/A	–40 to +40	Y	10	Preview	8/SO (D)

低电压差分信号(LVDS)、多点低电压差分信号(MLVDS)、RS-485/422/232



低电压差分信号(LVDS)器件选择指南

Device	Description	No. of Tx	No. of Rx	Input Signal	Output Signal	Signal Rate (Mbps)	Tx t_{pd} (typ) (ns)	Rx t_{pd} (typ) (ns)	I_{CC} (max) (mA)	ESD HBM (kV)	Supply Voltage (V)	Auto Qual (Q1)
LVDS												
SN65LVDS1	Single LVDS transmitter	1	—	LVTTL	LVDS	630	1.7	—	8	15	3.3	N
SN65LVDS2	Single LVDS receiver	—	1	LVDS	LVTTL	400	—	2.6	7	15	3.3	N
SN65LVDS180	Single full-duplex LVDS transceiver	1	1	LVTTL, LVDS	LVTTL, LVDS	400	1.7	3.7	12	12	3.3	Y
SN65LVDS051	Dual LVDS transmitter/receiver	2	2	LVDS, LVTTL	LVDS, LVTTL	400	1.7	3.7	20	12	3.3	Y
SN65LVDS84A	FlatLink™ transmitter	3	—	LVDS	LVDS	197	4.5	—	35	4	3.3	Y
SN65LVDS86A	FlatLink receiver	—	3	LVDS	LVDS	163	—	5	68	4	3.3	Y
SN65LVDS95	LVDS SerDes transmitter	3	—	LVDS	LVDS	170	4.2	—	110	6	3.3	Y
MLVDS												
SN65LVDM050	Dual LVDM transmitter/receiver	2	2	LVTTL, LVDM	LVTTL, LVDM	500	1.7	3.7	27	12	3.3	Y
SN65LVDM051	Dual LVDM transmitter/receiver	2	2	LVTTL, LVDM	LVTTL, LVDM	500	1.7	3.7	27	12	3.3	Y

RS-485/422/232选择指南

Temperature Prefix	Device	No. of Tx	No. of Rx	Supply Voltage (V)	Signaling Rate (Mbps)	I_{CC} (max) (mA)	ESD (kV)	Footprint	Auto Qual (Q1)
SN75	176A	1	1	5	10	50	2	SN75176	N
SN65, SN75	176B	1	1	5	10	70	2	SN75176	N
SN75	178B	1	1	5	10	70	2	SN75176	N
SN75	179B	1	1	5	10	70	2	SN75179	N
SN55, SN65, SN75	LBC176	1	1	5	10	1.5	2	SN75176	Y
SN65, SN75	LBC176A	1	1	5	30	15	12	SN65176	N
SN65, SN75	LBC179	1	1	5	10	5	2	SN75179	N
SN65, SN75	LBC179A	1	1	5	30	15	16	SN75179	N
SN65, SN75	LBC180	1	1	5	10	5	2	SN75LBC180	N
SN65, SN75	LBC180A	1	1	5	30	15	12	SN75180	N
SN65	C3221	1	1	3.3 or 5	1	1	15	SN75C3221	Y
MAX3238	—	5	3	3.3 or 5	0.25	2	15	—	Y

数据转换器/音频

模数转换器(ADC)选择指南

Device	Resolution (Bits)	Sample Rate (max)	Architecture	No. of Input Channels (SE)	Power Consumption (typ) (mW)	DNL (max) (±LSB)	INL (max) (±LSB)	No Missing Codes (Bits)	Analog Voltage AV/DD (min) (V)	Analog Voltage AV/DD (max) (V)	Logic Voltage DV/DD (min) (V)	Logic Voltage DV/DD (max) (V)	Input Type	Pin # / Pkg	Auto Qual (Q1)
ADS5204	10	40MSPS	Pipeline	2	275	1	1.5	10	0	3.6	0	3.6	Voltage	48/TQFP	Y
TLC2543	12	66kSPS	SAR	11	5	1	1	12	4.5	5.5	4.5	5.5	Voltage	20/SOP	Y
TLV1548	10	85kSPS	SAR	8	—	1	1	10	2.7	5.5	2.7	5.5	Voltage	20/SOP	Y
TLV2553	12	200kSPS	SAR	11	2.43	1	1	12	2.7	5.5	2.7	5.5	Voltage	20/SO, 20/TSSOP	Preview
TLV5535	8	35MSPS	Pipeline	1	106	2.4	2.4	—	3	3.6	3	3.6	Voltage	28/TSSOP	Y

D类音频放大器选择指南

Device	Description	Output Power (W)	Supply (V)	Half Power THD + N @ 1 kHz (%) (kHz)	Iq per channel (typ) (mA)	ISD (µA)	PSRR (dB)	Operating Temp Range (°C)	Pin # / Pkg	Auto Qual (Q1)
TPA2000D1	Mono filter-free class-D audio amplifier	2	2.7 to 5.5	0.2	4	0.05	77	–40 to 105	16/TSSOP	Y
TPA2005D1	1.4-W mono filter-free class-D audio power amplifier	1.18	2.5 to 5.5	0.2	2.8	0.5	75	–40 to 85	8/SON	Y

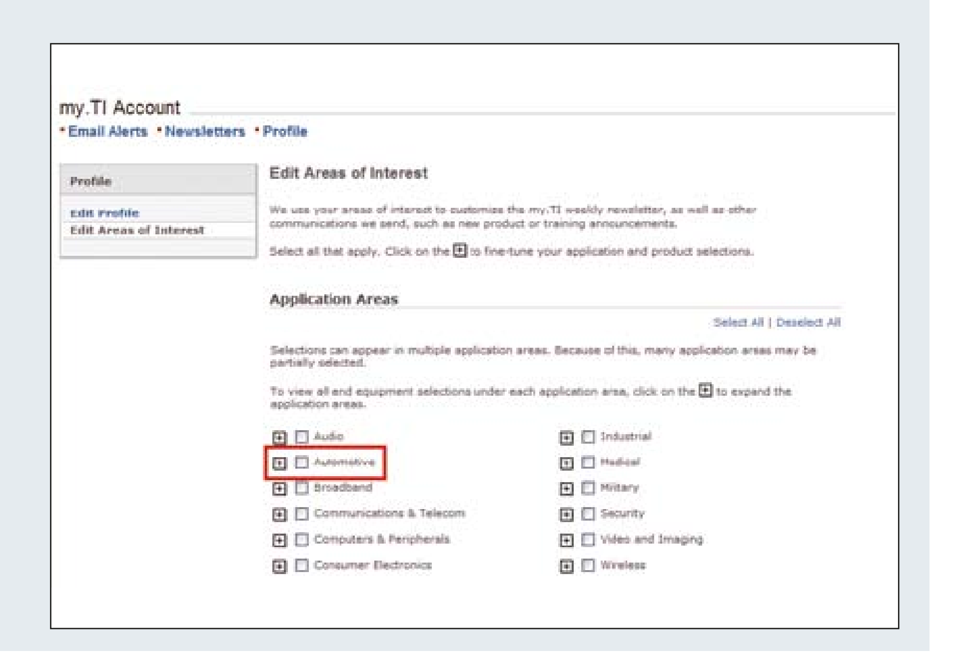
多媒体数字信号编解码器(Codec)选择指南

Device	Description	No. of DACs/ ADCs	Sampling Rate (max) (kHz)	Resolution (Bits)	SNR DAC/ ADC (typ) (dB)	Digital Audio Interface	Control Interface	P_D (typ) (mW)	Analog Supply (V)	Digital Supply (V)	Operating Temp Range (°C)	Pin # / Pkg	Auto Qual (Q1)
TLV320AIC23B	Stereo audio codec, 8- to 96-kHz, with integrated headphone amp	2/2	96	24	100 / 90	L, R, I²S, DSP	SPI, I²C	23	2.7 to 3.6	1.42 to 3.6	–40 to 85	28/TSSOP	Y
TWL1103T	Voice-band audio processor (VBAP)	—	—	15	—	—	I²C	—	2.7 to 3.3	2.7 to 3.3	–40 to 105	32/TQFP	Y



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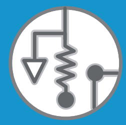
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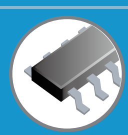
选择 基于您的标准，通过工具缩小选择范围，为您的设计选择适合的TI 产品



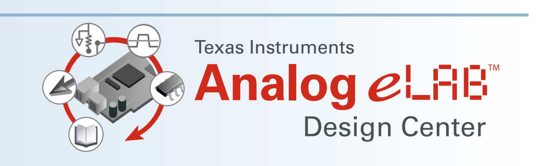
设计 采用所推荐的电路拓扑及TI的参考设计快速的设计您的电路



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